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Appendix 5D

OU-5 South WRA 2019-2020 Data Quality Summary, Laboratory, and Validation Reports

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Appendix 5D-1

2019-2020 OU-5 Data Quality Summary Report

APPENDIX 5D-1
Data Quality Summary Report
2019 – 2020 Operable Unit 5 Remedial Investigation

1.0 Data Quality Summary

This summary documents that the quality of the analytical data for soils collected from the Operable Unit 5 (OU-5) area in conjunction with the overall *Combined Operable Unit-4b, Unit-5, and Unit-6 Remedial Investigation Field Sampling and Analysis Plan* (Wood, 2019) (FSAP) generally met the data quality objectives (DQOs) set forth in the QAPP. Completed data quality assurance reviews (i.e., data verification and data validation) of the reported laboratory chemical results were conducted and documented by a third-party validator, Environmental Standards, Inc. Data quality has been evaluated in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS). The qualitative and quantitative criteria for PARCCs, often referred to as data quality indicators (DQIs), are presented in the approved Site-Wide Quality Assurance Project Plan, update version 5.1 (QAPP) for the Anaconda Copper Mine Site (ARC, 2018) and are the basis of the data quality assurance reviews.

All related laboratory reports and respective chemical data validation/verification reports are included in Appendix 5D-2 and Appendix 5D-3, respectively. A database export of reported results is provided in Appendix 5D-4. Summary data tables have been prepared based on data review results to support evaluation of overall data quality and availability for use in site characterization, risk assessment, or other remedial evaluations and are provided in Appendix 5E of the Remedial Investigation Report.

1.1 Data Quality Assurance Reviews

Data quality assurance reviews were conducted using a two-tiered approach for the OU-5 investigation samples. The first tier, data verification, was limited to evaluation of the reported quality control (QC) results provided in the Level II laboratory data report consistent with the QAPP with respect to the project DQIs and was completed for 100 percent of the overall chemical data set for the OU-5 soil samples. Data verification provided evaluation of the results for holding times, field and laboratory blank samples, laboratory control samples, matrix spike samples, matrix spike duplicate/laboratory duplicate samples, field duplicate samples, and quantitation below the laboratory reporting limit (RL), using the QC criteria specified in the QAPP. The second tier, data validation, was performed on a subset of the reported laboratory results, approximately 23 percent, for the overall OU-5 soil investigation samples using the more extensive laboratory data packages, or Level IV laboratory reports, and included the same review elements as data verification, as well as a review of instrument calibration records, laboratory performance criteria, raw data, and quantitative determinations using guidance from the National Functional Guidelines (U.S. EPA, 1994).

1.2 Data Acceptability

The overall quality of this data set was acceptable for supporting project decisions related to the referenced investigation areas for the Anaconda Copper Mine Site. More than 99 percent of the planned data was completed, and approximately 90 percent of the reported data was reported without data limitation, or qualification. As shown in Table 5D1-1, the qualified sample results do not indicate a problem that adversely affected the usability of the data for evaluation. The final data qualifiers, assigned to a limited number of sample results through the course of data verification and validation, indicate that some results are estimated but are useable as quantitative data, as reported. A majority of the J-qualified results simply imply that the result is below the method RL. In general, J-, UJ and other qualified results are available for use for evaluation of potential releases, the nature and extent of contamination, and

estimating potentially associated human health and ecological risks. Less than one percent of the data were qualified as rejected, nor deemed unusable. The remainder of the data collected are deemed useable for data evaluation purposes.

2.0 Data Quality Results

A total of 226 samples, including required field QC samples, were collected as summarized in Section 5.3.2 of the Remedial Investigation Report. The samples were submitted under proper chain-of-custody to the respective laboratories for testing. Laboratory deliverables were verified for completeness and compliance with project documents. Data quality assurance reviews for the chemical data analyzed and reported by Nevada certified TestAmerica and ACZ laboratories were completed by Environmental Standards, Inc. in accordance with the QAPP.

During data verification and validation activities, individual data points were qualified, if necessary, by applying flags (i.e., data validation flags) as an indication of data availability and usefulness for subsequent data evaluation and site decisions. Respective laboratory method flags and data validation flags were reconciled to a single "final data qualifier" by the third-party validator. All laboratory flags, data validation flags, and final qualifiers are retained with the respective sample results in the project database. Final data warranting qualification are discussed in the subsections below and a statistical summary of the overall data quality results, for both unqualified and qualified data, is provided in Table 5D1-1. All final sample results are presented in the data summary tables provided in Appendix 5E.

2.1 Laboratory Data Review Results

Laboratory methods were employed as referenced in the FSAP (Wood, 2019). The analytical procedures include the required quality control measures incorporated during the testing process, and together with the QAPP, are the basis for the DQIs used for data verification and validation.

- Most holding times presented in the QAPP were met by the laboratories. Sample results for nitrate/nitrite were qualified as estimated (i.e., flagged as "J") or as rejected (i.e., flagged as "R") based on holding time excursion due to the short holding times for testing. Twenty-seven results for nitrate/nitrite are not available for evaluation purposes.
- An appropriate laboratory control samples (LCS) was analyzed with each batch of environmental samples and results reported as percent recovery for each laboratory method in accordance with laboratory procedures. Few results were qualified based on noncompliance with the DQIs for the LCS, and all qualified results suggested a high bias indicating a conservative estimate for some boron results in the MWMP leachate.
- Ten matrix spike/matrix spike duplicate (MS/MSD) samples were submitted and reported as calculated percent recoveries for each applicable laboratory method, along with other random lab selected samples, satisfying the minimum requirement (five percent of primary samples) outlined in the QAPP. Approximately six percent of the sample results were qualified as estimated (i.e., flagged as "J" or "UJ") on the basis of aberrant MS/MSDs. Data most often qualified due to of aberrant MS/MSD exhibited a low bias in qualified results for antimony, barium, and strontium in soil samples. Other commonly qualified results included copper, calcium, and phosphorus.
- Laboratory blanks, consisting of contaminant-free water, were prepared and analyzed in accordance with laboratory standard operating procedures (SOPs) to monitor for potential contamination of laboratory equipment, reagents and sample containers and were reported with the respective sample results for each analytical batch. Less than two percent of the reported samples results were qualified (i.e., flagged as "UJ") due to associated detections in the laboratory

method blanks, including detections below the RL. Lab blank contamination was most often associated with uranium and Radium-226 analyses. The limited occurrence of data qualification should not have a primary influence on the results, and the reported results are considered useful as qualified.

- All calibration standards, procedural check solutions, internal standards and tracer solutions, dilutions, and calculations reviewed during data validation were found to comply with method procedures. Compliance of these laboratory processes with method requirements contributes to the acceptable quality of the data.

Laboratory reports are presented in Appendix 5D-2. Analytical results, including the qualified results described above, are summarized in Appendix 5E, and are detailed in the respective data validation reports provided in Appendix 5D-3.

2.2 Field Data Review Results

Approved SOPs were used for sample collection and sample testing activities. The SOPs were presented in the FSAP for this investigation which included the requirements for collecting field QC samples using the guidance provided in the QAPP. Field QC samples collected for this investigation included field blanks, equipment blanks, and field duplicate samples. Evaluation of the field QC sample results was based on the DQIs presented in the QAPP for applicable methods and included with the data verification and validation reporting.

- Nineteen soil field duplicate (FD) samples were collected satisfying the minimum requirement (10 percent of primary field samples) set forth in the QAPP. A subset of nine FD samples were analyzed from the meteoric water mobility procedure (MWMP). The precision results for FD samples are summarized in Tables 5D1-2a and 5D1-2b, for soils and MWMP leachates. The calculated relative percent difference (RPD) and replicate error ratio (RER) met the analyte-specific criteria established in the QAPP for most target analytes. Approximately one percent of the data was qualified on the basis of aberrant field duplicate results, and these data are considered estimates (i.e., flagged as "J"). Qualified results occurred most often for Radium-226 and Radium-228, including concentrations below the RL. The reported concentrations are considered useful as qualified.
- Ten field blank (FB) samples and ten equipment blank (EB) samples, consisting of contaminant-free water, were collected in accordance with field SOPs satisfying the minimum requirement (five percent of primary samples) set forth in the QAPP. Table 5D1-3 summarizes results in blank samples collected in the field. No results were qualified on the basis of field blank contamination. The limited detections reported in these blank samples indicate field sampling procedures were effective in preventing cross contamination during sampling.

2.3 Data Completeness

All samples submitted for testing were completed as planned. As summarized and presented in this report, approximately 90 percent of the data reported are acceptable without any qualification (i.e., categorized as fully usable quantitative data). Data categorized as "usable as qualified" are also considered quantitative data and make up an additional 8 percent of the samples from the 2019-2020 OU-5 soil data set. Less than one percent of reported results were deemed "unusable" in terms of evaluation of the PARCCs, and the completeness goal (90 percent) was achieved for this subset of investigation activities.

3.0 References

Atlantic Richfield Company (ARC), 2018. Site-Wide Quality Assurance Project Plan, Update Version 5.1, Anaconda Copper Mine Site, Yerington, Nevada. September 5.

Wood, 2019. Combined Operable Unit-4b, Unit-5, and Unit-6 Remedial Investigation Field Sampling and Analysis Plan, Anaconda Copper Mine Site, Yerington, Nevada. Prepared for Atlantic Richfield Company. May 7.

U.S. EPA, 1994, Contract Laboratory Program National Functional Guidelines for Inorganics Data Review. Office of Emergency and Remedial Response, Washington, DC. February.

Tables

Appendix 5D-1, Table 5D1-1
Summary of Analytical Data Quality by Method - OU-5 2019-2020
Combined OU-4b, OU-5, and OU-6 Remedial Investigation
Anaconda Copper Mine Site
Lyon County, Nevada

Sampling and Analyses				Summary of Data Qualification							Completeness and Data Usability			
Method	**Parameter**	**Planned Samples**	**Completed Samples**	**Total Results Planned**	**Total Results Obtained**	**Results Not Qualified**	**Detections Qualified Estimated Below RL**	**Detections Qualified Estimated DQI Outliers**	**Non-detects Qualified Estimated DQI Outliers**	**Results Qualifed Rejected DQI Outliers**	**Overall Complete Data[1]**	**Data Qualified Due to DQI Outliers**	**Overall Usable Data[2]**	**Data Quality Comments**
EPA 6010B	Total ICP Metals[3]	206	206	2,472	2,472	2,046	121	300	5	0	**100%**	**12%**	**100%**	*Estimated data most often occurred due to MS/MSD recoveries.*
EPA 6020/6020A	Total ICP-MS Metals[4]	206	206	3,914	3,914	3,196	318	368	32	0	**100%**	**10.2%**	**100%**	*Estimated data most often occurred due to MS/MSD recoveries.*
EPA 7471A	Total Mercury	206	206	206	206	181	25	0	0	0	**100%**	**0%**	**100%**	*All estimated data are below the RL.*
EPA 901.1Mod	Radium-226	206	206	206	206	187	9	10	0	0	**100%**	**5%**	**100%**	*Estimated data most often occurred due to field duplicate imprecision.*
EPA 901.1Mod	Radium-228	206	206	206	206	170	12	24	0	0	**100%**	**12%**	**100%**	*Estimated data most often occurred due to lab duplicate imprecision.*
EPA 6010D	MWMP ICP Metals	98	98	1,274	1,274	852	302	22	98	0	**100%**	**9%**	**100%**	*Estimated data most often occurred due to lab blank contamination near or below the RL, or MS/MSD recoveries*
EPA 6020B	MWMP ICP-MS Metals	98	98	1,764	1,764	1,389	257	75	43	0	**100%**	**7%**	**100%**	*Estimated data most often occurred due to lab duplicate imprecision or lab blank contamination.*
EPA 7470A	MWMP Mercury	98	98	98	98	95	3	0	0	0	**100%**	**0%**	**100%**	*All estimated data are below the RL.*
EPA 903.1Mod	MWMP Radium-226	98	98	98	98	48	0	32	18	0	**100%**	**51%**	**100%**	*Estimated data most often occurred due to lab duplicate imprecision.*
EPA 9320	MWMP Radium-228	98	98	98	98	96	0	1	1	0	**100%**	**2%**	**100%**	*Estimated data due to field duplicate imprecision.*
SM 4500-Cl/ ASTM D516	MWMP Chloride, Sulfate	98	98	196	196	138	42	11	5	0	**100%**	**8%**	**100%**	*Most estimated data are below the RL.*
EPA 351.3	MWMP Nitrate+Nitrite (N)[5]	98	98	98	98	33	11	13	14	27	**72%**	**55%**	**72%**	*Estimated and rejected data occurred due to missed holding time.*
SM 2320B	MWMP Alkalinity (as $CaCO_3$)[6]	98	98	98	98	87	10	1	0	0	**100%**	**1%**	**100%**	*Most estimated data are below the RL.*
SM 2540C	MWMP Total Dissolved Solids	98	98	98	98	95	3	0	0	0	**100%**	**0%**	**100%**	*All estimated data are below the RL.*
SM 4500-CN	MWMP WAD Cyanide	98	98	98	98	93	0	0	5	0	**100%**	**5%**	**100%**	*Estimated data occurred due to missed holding time.*
SM 4500-F	MWMP Fluoride	98	98	98	98	85	0	11	2	0	**100%**	**13%**	**100%**	*Estimated data occurred due to lab blank contamination.*
EPA 351.2	MWMP Total Kjeldahl Nitrogen	98	98	98	98	47	51	0	0	0	**100%**	**0%**	**100%**	*All estimated data are below the RL.*
Total 2019 - 2020 OU-5 Soil Sampling Program				11,120	11,120	8,838	1,164	868	223	27	**99.8%**	**10%**	**99%**	***Overall, data meet QAPP requirements for completenss.***

Note(s)
1. Percent completeness calculated based on number of non-rejected results out of total planned results for primary and field duplicate samples only.
2. Percent usability calculated based on number of non-rejected results out of total results obtained for primary and field duplicate samples only.
3. Metals include aluminum, boron, calcium, iron, lithium, magnesium, phosphorus, potassium, sodium, strontium, tin, and titanium.
4. Metals include antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, thallium, thorium, uranium, vanadium, and zinc.
5. Laboratory reported nitrate and nitrite with total combined concentration.
6. Laboratory reported total, bicarbonate, carbonate, and hydroxide forms of alkalinity.

Abbreviation(s)
% = percent
$CaCO_3$ = calcium carbonate
DQI = data quality indicators
EPA = Environmental Protection Agency
ICP = inductively coupled plasma
ICP-MS = inductively coupled plasma-mass spectrometry
MWMP = meteoric water mobility procedure
N = Nitrogen
OU = operable unit
RL = reporting limit
SM = Standard Methods for Water and Wastewater

Appendix 5D-1, Table 5D1-2a
Summary of Soil Field Duplicate Results - OU-5 2019 - 2020
Combined OU-4b, OU-5, and OU-6 Remedial Investigation
Anaconda Copper Mine Site
Lyon County, Nevada

Location ID		WRSB-206	WRSB-206		WRSB-206	WRSB-206		WRSB-207	WRSB-207		WRSB-208	WRSB-208		WRSB-208	WRSB-208		WRSB-211	WRSB-211		WRSB-213	WRSB-213	
Depth (ft bgs)		6-15	6-15		115-125	115-125		85-95	85-95		15-25	15-25		65-75	65-75		3-6	3-6		6-15	6-15	
Sample Date		1/21/2020	1/21/2020		1/21/2020	1/21/2020		1/22/2020	1/22/2020		1/7/2020	1/7/2020		1/7/2020	1/7/2020		12/18/2019	12/18/2019		1/13/2020	1/13/2020	
Sample Type		N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]
Total Metals	***DQI Outliers***																					
Aluminum (mg/Kg)	0%	6400	7300	13%	6500	8000	21%	8500	8000	6%	8300	8100	2%	8900	9200	3%	9800	9600	2%	10000	9800	2%
Antimony (mg/Kg)	0%	1.7	1.6	6%	< 0.29	0.34	NC	0.42	0.37	13%	0.43	0.37	15%	0.32	0.43	29%	< 0.28	0.34	NC	0.37	0.4	8%
Arsenic (mg/Kg)	11%	14	15	7%	4.3	6.0	33%	6.5	5.5	17%	6.3	5.7	10%	4.9	6.5	28%	4.8	5.3	10%	7.6	7.9	4%
Barium (mg/Kg)	11%	32	34	6%	82	91	10%	150	83	58%	91	85	7%	110	97	13%	100	120	18%	88	100	13%
Beryllium (mg/Kg)	0%	0.36	0.42	15%	0.36	0.43	18%	0.45	0.37	20%	0.41	0.42	2%	0.44	0.45	2%	0.56	0.57	2%	0.51	0.46	10%
Boron (mg/Kg)	0%	< 2.6	< 2.6	NC	5.8	5.9	2%	4.8	5.1	6%	5.4	4.9	10%	4.6	4.7	2%	2.9	2.9	0%	8.6	8.1	6%
Cadmium (mg/Kg)	0%	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.27	< 0.26	NC	< 0.26	< 0.27	NC	< 0.26	< 0.26	NC
Calcium (mg/Kg)	5%	4100	4600	11%	4100	4800	16%	5800	5900	2%	6600	6900	4%	5100	5600	9%	3600	3500	3%	7400	6400	14%
Chromium (mg/Kg)	11%	4.7	5.0	6%	6.4	13	**68%**	11	8.7	23%	8.7	7.9	10%	11	11	0%	5.2	6.2	18%	9.4	8.9	5%
Cobalt (mg/Kg)	5%	17	18	6%	3.9	4.8	21%	5.3	4.4	19%	4.6	5.0	8%	4.5	4.2	7%	3.6	4.5	22%	5.1	5.6	9%
Copper (mg/Kg)	0%	2300	3300	36%	63	220	111%	88	64	32%	110	110	0%	45	37	20%	12	15	22%	60	58	3%
Iron (mg/Kg)	0%	20000	21000	5%	13000	14000	7%	14000	14000	0%	16000	15000	6%	15000	16000	6%	13000	13000	0%	15000	15000	0%
Lead (mg/Kg)	0%	3.5	3.3	6%	3.7	4.6	22%	5.0	4.2	17%	8.3	7.3	13%	5.3	5.4	2%	4.6	6.3	31%	4.9	5.0	2%
Lithium (mg/Kg)	0%	7.1	7.7	8%	6.3	7.4	16%	7.9	8.3	5%	8.7	7.9	10%	7.7	8.3	8%	6.1	5.7	7%	8.9	8.6	3%
Magnesium (mg/Kg)	0%	4500	4900	9%	2700	3300	20%	3400	3500	3%	3500	3500	0%	3100	3100	0%	2700	2600	4%	3800	3700	3%
Manganese (mg/Kg)	0%	76	78	3%	210	260	21%	280	210	29%	270	280	4%	330	300	10%	350	480	31%	260	290	11%
Mercury (mg/Kg)	0%	0.13	0.11	17%	< 0.013	< 0.013	NC	< 0.012	< 0.012	NC	< 0.012	< 0.013	NC	< 0.013	< 0.012	NC	< 0.013	< 0.013	NC	0.016	0.017	6%
Molybdenum (mg/Kg)	11%	6.2	6.6	6%	0.67	1.7	87%	1.5	1.0	40%	1.5	1.3	14%	1.3	1.3	0%	0.9	1.1	20%	0.97	0.92	5%
Nickel (mg/Kg)	5%	10	11	10%	4.7	7.1	**41%**	6.6	5.6	16%	5.8	5.9	2%	5.3	5.1	4%	3.2	4.3	29%	6.6	6.5	2%
Phosphorus (mg/Kg)	11%	1000	1200	18%	490	430	13%	450	460	2%	500	500	0%	440	420	5%	310	290	7%	630	480	27%
Potassium (mg/Kg)	0%	1100	1200	9%	930	1300	33%	1400	1300	7%	1300	1300	0%	1500	1500	0%	1700	1600	6%	1600	1500	6%
Selenium (mg/Kg)	16%	7.6	7.7	1%	1.4	1.5	7%	1.5	1.2	22%	1.6	1.4	13%	1.9	1.6	17%	1.5	2.1	33%	1.6	1.6	0%
Silver (mg/Kg)	0%	< 0.11	< 0.10	NC	< 0.11	< 0.10	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.11	< 0.11	NC	< 0.10	< 0.11	NC	< 0.11	< 0.10	NC
Sodium (mg/Kg)	5%	140	130	7%	650	690	6%	690	530	26%	530	520	2%	590	600	2%	390	360	8%	850	860	1%
Strontium (mg/Kg)	5%	33	39	17%	43	49	13%	82	57	36%	59	61	3%	64	61	5%	58	54	7%	68	68	0%
Thallium (mg/Kg)	0%	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.27	< 0.26	NC	< 0.26	< 0.27	NC	< 0.26	< 0.26	NC
Thorium (mg/Kg)	0%	7.3	6.7	9%	6.6	7.1	7%	7.3	9.3	24%	5.4	6	11%	7.7	8.7	12%	11	9.8	12%	7.9	7.4	7%
Tin (mg/Kg)	0%	< 5.3	< 5.2	NC	< 5.3	< 5.2	NC	< 5.2	< 5.2	NC	< 5.2	< 5.1	NC	< 5.3	< 5.3	NC	< 5.2	< 5.1	NC	< 5.3	< 5.2	NC
Titanium (mg/Kg)	0%	41	41	0%	280	370	28%	370	340	8%	380	330	14%	380	410	8%	270	260	4%	350	350	0%
Uranium (mg/Kg)	11%	21	14	40%	1.3	1.2	8%	1.2	1.8	40%	1.3	1.5	14%	1.1	1.3	17%	2.1	2	5%	1.6	2.2	32%
Vanadium (mg/Kg)	11%	22	23	4%	30	35	15%	39	31	23%	36	34	6%	34	34	0%	20	24	18%	38	40	5%
Zinc (mg/Kg)	5%	17	19	11%	22	26	17%	36	23	**44%**	25	23	8%	29	29	0%	28	31	10%	28	27	4%
Radionuclides																						
Radium-226 (pCi/g)	5%	7.35 +/-0.978	5.69 +/-0.679	1.4	1.88 +/-0.334	1.23 +/-0.274	1.5	1.38 +/-0.273	1.40 +/-0.294	0.3	1.10 +/-0.213	1.41 +/-0.236	1.0	1.64 +/-0.348	1.40 +/-0.262	0.6	1.88 +/-0.342	1.72 +/-0.300	0.4	1.41 +/-0.301	1.35 +/-0.221	0.2
Radium-228 (pCi/g)	5%	1.74 +/-0.406	1.12 +/-0.250	1.3	1.57 +/-0.341	1.46 +/-0.308	0.2	1.18 +/-0.322	1.72 +/-0.341	1.2	1.25 +/-0.254	1.52 +/-0.264	0.7	1.41 +/-0.362	1.78 +/-0.404	0.7	2.17 +/-0.367	2.16 +/-0.427	0.02	1.65 +/-0.371	1.28 +/-0.268	0.8

Appendix 5D-1, Table 5D1-2a
Summary of Soil Field Duplicate Results - OU-5 2019 - 2020
Combined OU-4b, OU-5, and OU-6 Remedial Investigation
Anaconda Copper Mine Site
Lyon County, Nevada

Location ID		WRSB-217	WRSB-217		WRSB-218	WRSB-218		WRSB-220	WRSB-220		WRSB-222	WRSB-222		WRSB-224	WRSB-224		WRSB-227	WRSB-227	
Depth (ft bgs)		0-0.5	0-0.5		0.5-3	0.5-3		3-6	3-6		0.5-3	0.5-3		3-6	3-6		0.5-3	0.5-3	
Sample Date		12/17/2019	12/17/2019		12/17/2019	12/17/2019		1/21/2020	1/21/2020		1/15/2020	1/15/2020		1/21/2020	1/21/2020		1/24/2020	1/24/2020	
Sample Type		N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]
Total Metals	***DQI Outliers***																		
Aluminum (mg/Kg)	0%	8300	7800	6%	8500	8000	6%	5900	6100	3%	12000	13000	8%	12000	12000	0%	5800	5200	11%
Antimony (mg/Kg)	0%	< 0.37	< 0.36	NC	< 0.39	< 0.55	NC	0.4	0.86	73%	0.72	0.77	7%	1.7	2.2	26%	1.8	1.8	0%
Arsenic (mg/Kg)	11%	5.1	5.2	2%	5.1	5.4	6%	5.3	15	**96%**	7.9	7.6	4%	18	18	0%	23	27	16%
Barium (mg/Kg)	11%	120	66	**58%**	110	120	9%	54	90	**50%**	100	100	0%	66	58	13%	72	58	22%
Beryllium (mg/Kg)	0%	0.38	0.3	24%	0.43	0.42	2%	0.22	0.44	67%	0.46	0.47	2%	0.42	0.29	37%	0.34	0.36	6%
Boron (mg/Kg)	0%	5.9	6.1	3%	3.6	3.2	12%	< 2.5	< 2.5	NC	6.3	6.8	8%	< 2.7	< 2.6	NC	< 2.7	< 2.5	NC
Cadmium (mg/Kg)	0%	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.25	< 0.25	NC	< 0.26	< 0.25	NC	< 0.27	< 0.26	NC	< 0.27	< 0.25	NC
Calcium (mg/Kg)	5%	8700	7800	11%	5500	4900	12%	4200	2100	**67%**	4700	5200	10%	5500	5500	0%	3300	2800	16%
Chromium (mg/Kg)	11%	7.0	7.7	10%	7.3	7.5	3%	3.2	3.2	0%	8.7	8.4	4%	13	20	**42%**	1.8	1.7	6%
Cobalt (mg/Kg)	5%	4.2	4.3	2%	4.2	5.3	23%	3.1	3.8	20%	6.8	7.4	8%	14	14	0%	16	6.1	**90%**
Copper (mg/Kg)	0%	52	55	6%	25	32	25%	2300	2700	16%	800	740	8%	3200	3300	3%	1400	1100	24%
Iron (mg/Kg)	0%	13000	14000	7%	13000	13000	0%	12000	16000	29%	17000	18000	6%	21000	22000	5%	19000	18000	5%
Lead (mg/Kg)	0%	3.7	3.7	0%	5.2	5.4	4%	4.0	5.8	37%	4.8	4.5	6%	5.5	5.6	2%	12	10	18%
Lithium (mg/Kg)	0%	8.0	7.5	6%	7.2	6.5	10%	4.5	6.3	33%	8.1	8.9	9%	8.6	8.8	2%	7.3	6.4	13%
Magnesium (mg/Kg)	0%	3200	3100	3%	2800	2800	0%	2900	2500	15%	5800	5500	5%	9700	10000	3%	1800	1500	18%
Manganese (mg/Kg)	0%	180	190	5%	360	350	3%	27	30	11%	200	220	10%	110	110	0%	230	180	24%
Mercury (mg/Kg)	0%	< 0.012	< 0.012	NC	< 0.013	< 0.012	NC	0.073	0.098	29%	0.10	0.078	25%	0.32	0.25	25%	0.014	< 0.012	NC
Molybdenum (mg/Kg)	11%	0.52	0.55	6%	0.56	< 0.53	NC	10	23	**79%**	8.5	5.1	**50%**	11	13	17%	8.4	8.4	0%
Nickel (mg/Kg)	5%	4.9	5.3	8%	4.7	6.1	26%	5.1	5.6	9%	9.3	8.6	8%	20	22	10%	3.0	2.7	11%
Phosphorus (mg/Kg)	11%	450	440	2%	370	410	10%	1600	960	**50%**	730	760	4%	1700	1800	6%	790	700	12%
Potassium (mg/Kg)	0%	1200	1100	9%	1500	1300	14%	1600	1300	21%	1900	2000	5%	1900	2000	5%	1200	1000	18%
Selenium (mg/Kg)	16%	0.44	0.29	**41%**	0.99	1.2	19%	4.5	7	**43%**	2.3	1.9	19%	2.9	3.0	3%	3.7	3.7	0%
Silver (mg/Kg)	0%	< 0.10	< 0.10	NC	< 0.10	< 0.11	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.11	< 0.10	NC	< 0.11	< 0.10	NC
Sodium (mg/Kg)	5%	980	630	**43%**	550	590	7%	36	< 32	NC	440	500	13%	68	95	33%	130	140	7%
Strontium (mg/Kg)	5%	100	61	**48%**	58	65	11%	34	49	36%	56	60	7%	57	65	13%	72	58	22%
Thallium (mg/Kg)	0%	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.25	< 0.25	NC	< 0.26	< 0.25	NC	< 0.27	< 0.26	NC	< 0.27	< 0.25	NC
Thorium (mg/Kg)	0%	5.4	6.6	20%	8	7.9	1%	18	16	12%	10	12	18%	5.2	4.3	19%	18	14	25%
Tin (mg/Kg)	0%	< 5.2	< 5.2	NC	< 5.1	< 5.3	NC	< 5.1	< 5.1	NC	< 5.1	< 5.1	NC	< 5.3	< 5.1	NC	< 5.3	< 5.0	NC
Titanium (mg/Kg)	0%	350	350	0%	340	310	9%	53	45	16%	450	490	9%	520	500	4%	49	40	20%
Uranium (mg/Kg)	11%	1.0	1.3	26%	1.2	1.2	0%	11	12	9%	3.4	2.7	23%	4.9	5.0	2%	6.9	5.7	19%
Vanadium (mg/Kg)	11%	31	34	9%	31	34	9%	11	19	**53%**	38	35	8%	40	40	0%	17	17	0%
Zinc (mg/Kg)	5%	22	22	0%	30	31	3%	10	11	10%	25	24	4%	26	28	7%	17	15	13%
Radionuclides																			
Radium-226 (pCi/g)	5%	1.23 +/-0.245	1.21 +/-0.261	0.1	1.63 +/-0.330	1.48 +/-0.282	0.3	2.59 +/-0.374	2.57 +/-0.375	0.04	1.51 +/-0.317	1.76 +/-0.349	0.53	1.91 +/-0.298	1.99 +/-0.346	0.18	1.34 +/-0.304	3.42 +/-0.510	**3.5**
Radium-228 (pCi/g)	5%	1.51 +/-0.298	1.16 +/-0.395	0.7	2.04 +/-0.420	1.33 +/-0.417	1.2	2.30 +/-0.389	2.21 +/-0.438	0.2	1.49 +/-0.455	2.00 +/-0.420	0.82	1.11 +/-0.223	1.03 +/-0.257	0.24	1.30 +/-0.298	2.65 +/-0.502	**2.3**

Appendix 5D-1, Table 5D1-2a
Summary of Soil Field Duplicate Results - OU-5 2019 - 2020
Combined OU-4b, OU-5, and OU-6 Remedial Investigation
Anaconda Copper Mine Site
Lyon County, Nevada

Location ID		WRSB-228	WRSB-228		WRSB-230	WRSB-230		WRSB-232	WRSB-232		WRSB-236	WRSB-236		WRSB-238	WRSB-238		WRSB-240	WRSB-240	
Depth (ft bgs)		0.5-3	0.5-3		3-6	3-6		6-15	6-15		3-6	3-6		6-15	6-15		0-0.5	0-0.5	
Sample Date		1/23/2020	1/23/2020		1/16/2020	1/16/2020		1/17/2020	1/17/2020		1/20/2020	1/20/2020		1/27/2020	1/27/2020		1/21/2020	1/21/2020	
Sample Type		N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]
Total Metals	***DQI Outliers***																		
Aluminum (mg/Kg)	0%	1600	1800	12%	7500	5600	29%	8300	7000	17%	7800	7800	0%	8200	8000	2%	8000	9100	13%
Antimony (mg/Kg)	0%	0.59	0.74	23%	0.32	< 0.28	NC	0.33	0.4	19%	0.31	0.31	0%	< 0.28	0.29	NC	0.31	0.33	6%
Arsenic (mg/Kg)	11%	9.7	15	**43%**	4.4	3.2	32%	5.2	5.0	4%	5.8	5.9	2%	8.2	8.9	8%	6.3	7.0	11%
Barium (mg/Kg)	11%	44	52	17%	62	52	18%	85	70	19%	71	75	5%	56	65	15%	87	110	23%
Beryllium (mg/Kg)	0%	< 0.15	< 0.15	NC	0.40	0.25	46%	0.45	0.46	2%	0.32	0.32	0%	0.25	0.28	11%	0.34	0.37	8%
Boron (mg/Kg)	0%	< 2.5	< 2.6	NC	5	4	22%	4.4	4.4	0%	7.4	7.2	3%	5.2	5.3	2%	5.9	6.7	13%
Cadmium (mg/Kg)	0%	< 0.25	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.25	NC
Calcium (mg/Kg)	5%	1300	1400	7%	4900	4100	18%	5600	6300	12%	8900	8400	6%	6800	6900	1%	8600	11000	24%
Chromium (mg/Kg)	11%	1.1	1.4	24%	6.1	5.5	10%	7.5	7.0	7%	7.4	8.1	9%	16	15	6%	9.1	9.7	6%
Cobalt (mg/Kg)	5%	0.29	0.3	3%	3.7	3.1	18%	4.7	4.4	7%	4.4	4.6	4%	3.5	3.5	0%	5.7	5.6	2%
Copper (mg/Kg)	0%	71	92	26%	57	44	26%	65	67	3%	75	76	1%	190	170	11%	94	96	2%
Iron (mg/Kg)	0%	14000	17000	19%	12000	9300	25%	14000	12000	15%	13000	13000	0%	17000	15000	13%	13000	15000	14%
Lead (mg/Kg)	0%	2.9	3.3	13%	3.6	2.8	25%	4.4	4.3	2%	3.7	3.8	3%	3.3	3.7	11%	4.6	5.0	8%
Lithium (mg/Kg)	0%	4.3	5	15%	6.6	4.8	32%	7.9	6.9	14%	8.1	8.0	1%	9.9	9.6	3%	8.8	9.9	12%
Magnesium (mg/Kg)	0%	310	340	9%	2900	2100	32%	3300	2800	16%	3800	3800	0%	4300	4000	7%	3800	4100	8%
Manganese (mg/Kg)	0%	6.0	6.3	5%	180	140	25%	240	220	9%	190	200	5%	140	150	7%	230	260	12%
Mercury (mg/Kg)	0%	0.023	0.037	47%	< 0.012	< 0.012	NC	< 0.012	< 0.012	NC	< 0.012	< 0.012	NC	0.017	0.027	45%	< 0.012	< 0.012	NC
Molybdenum (mg/Kg)	11%	22	32	37%	< 0.51	0.55	NC	0.55	0.85	43%	0.85	0.78	9%	4.3	4.4	2%	0.65	0.72	10%
Nickel (mg/Kg)	5%	0.55	0.6	9%	5.1	3.6	34%	5.5	5.0	10%	5.6	5.9	5%	8.4	7.8	7%	7.2	7.3	1%
Phosphorus (mg/Kg)	11%	450	470	4%	440	280	**44%**	390	390	0%	480	490	2%	490	500	2%	540	550	2%
Potassium (mg/Kg)	0%	1300	1500	14%	1200	870	32%	1200	1100	9%	1300	1400	7%	1000	1100	10%	1500	1600	6%
Selenium (mg/Kg)	16%	3.9	4.6	16%	1.6	1	**46%**	1.1	1.5	31%	0.94	1.1	16%	1.6	1.6	0%	1.1	1.3	17%
Silver (mg/Kg)	0%	0.16	0.12	29%	< 0.10	< 0.11	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.11	< 0.10	NC	< 0.10	< 0.10	NC
Sodium (mg/Kg)	5%	360	380	5%	710	670	6%	500	530	6%	590	620	5%	490	440	11%	250	300	18%
Strontium (mg/Kg)	5%	34	39	14%	47	36	27%	55	50	10%	65	69	6%	61	58	5%	63	80	24%
Thallium (mg/Kg)	0%	< 0.25	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.26	NC	< 0.26	< 0.25	NC
Thorium (mg/Kg)	0%	26	26	0%	8.7	5.2	50%	7.2	6.0	18%	5.3	6.4	19%	4.8	6.1	24%	5.5	6.8	21%
Tin (mg/Kg)	0%	< 5.0	< 5.1	NC	< 5.1	< 5.3	NC	< 5.2	< 5.2	NC	< 5.1	< 5.2	NC	< 5.3	< 5.2	NC	< 5.2	< 5.1	NC
Titanium (mg/Kg)	0%	18	18	0%	250	240	4%	330	280	16%	410	440	7%	210	210	0%	390	420	7%
Uranium (mg/Kg)	11%	2.3	3.5	**41%**	1.3	0.98	28%	1.2	1.1	9%	1.1	1.3	17%	3.4	6.6	**64%**	0.99	1.3	27%
Vanadium (mg/Kg)	11%	8.6	13	**41%**	25	21	17%	32	29	10%	32	35	9%	27	29	7%	38	40	5%
Zinc (mg/Kg)	5%	< 5.0	< 5.1	NC	21	17	21%	25	26	4%	22	23	4%	22	22	0%	25	29	15%
Radionuclides																			
Radium-226 (pCi/g)	5%	1.07 +/-0.272	1.12 +/-0.243	0.14	1.40 +/-0.331	0.985 +/-0.175	1.1	1.32 +/-0.237	1.34 +/-0.268	0.3	1.09 +/-0.246	0.988 +/-0.278	0.3	1.64 +/-0.295	2.41 +/-0.367	1.6	1.12 +/-0.236	1.19 +/-0.227	0.2
Radium-228 (pCi/g)	5%	1.55 +/-0.412	1.70 +/-0.317	0.29	1.60 +/-0.367	1.14 +/-0.218	1.1	1.61 +/-0.319	1.60 +/-0.374	0.02	1.04 +/-0.282	1.29 +/-0.345	0.6	1.22 +/-0.366	0.740 +/-0.400	0.9	1.25 +/-0.257	1.17 +/-0.256	0.2

Note(s)
1. RPD or RER calculated using equations presented in the QAPP when at least one reported result in the duplicate pair is greater than the detection limit.
2. Calculated values not meeting precision criteria (DQI) in the QAPP for applicable parameters are shown in bold font.

Abbreviation(s)
% = percent
< = less than
DQI = data quality indicator
FD = field duplicate sample
ID = identification
mg/Kg = milligram per kilogram
N = normal (primary) sample
NC = not calculated
OU = operable unit
pCi/g = picocurie per gram
QAPP = quality assurance project plan
RER = replicate error ratio
RPD = relative percent difference

Appendix 5D-1, Table 5D1-2b
Summary of MWMP Field Duplicate Results - OU-5 2019 - 2020
Combined OU-4b, OU-5, and OU-6 Remedial Investigation
Anaconda Copper Mine Site
Lyon County, Nevada

Location ID	WRSB-206	WRSB-206		WRSB-208	WRSB-208		WRSB-213	WRSB-213		WRSB-218	WRSB-218		WRSB-222	WRSB-222		WRSB-227	WRSB-227	
Sample Depth (ft bgs)	6-15	6-15		65-75	65-75		6-15	6-15		0.5-3	0.5-3		0-0.5	0-0.5		0.5-3	0.5-3	
Sample Date	1/21/2020	1/21/2020		1/7/2020	1/7/2020		1/13/2020	1/13/2020		12/17/2019	12/17/2019		1/15/2020	1/15/2020		1/24/2020	1/24/2020	
Sample Type	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]
MWMP Metals	***DQI Outlier***																	
Aluminum (mg/L)	11%	156	106	38%	0.07	0.05	33%	0.1	0.17	52%	0.15	0.12	22%	<0.05	0.08	NC	0.06	0.05	18%
Antimony (mg/L)	0%	<0.004	<0.004	NC	0.0007	0.0007	0%	0.0005	0.0009	57%	<0.0004	0.0004	NC	<0.0004	0.0006	NC	<0.0004	<0.0004	NC
Arsenic (mg/L)	11%	0.009	0.008	12%	0.0514	0.0464	10%	0.098	0.122	22%	0.0831	0.094	12%	0.025	0.0423	**51%**	0.0294	0.0372	23%
Barium (mg/L)	22%	<0.04	<0.04	NC	<0.011	<0.012	NC	<0.007	<0.007	NC	<0.007	<0.007	NC	<0.007	0.008	NC	<0.007	0.007	NC
Beryllium (mg/L)	0%	0.0427	0.0366	15%	<8e-005	<8e-005	NC	<8e-005	<8e-005	NC	<8e-005	<8e-005	NC	<8e-005	<8e-005	NC	<8e-005	<8e-005	NC
Boron (mg/L)	11%	<0.1	<0.2	NC	<0.42	<0.4	NC	1.34	1.36	1%	<0.29	<0.29	NC	0.4	0.77	**63%**	<0.14	<0.15	NC
Cadmium (mg/L)	0%	0.0091	0.0087	4%	<5e-005	<5e-005	NC	<5e-005	<5e-005	NC	<5e-005	<5e-005	NC	<5e-005	<5e-005	NC	<5e-005	<5e-005	NC
Calcium (mg/L)	11%	387	348	11%	4.3	4.5	5%	1.1	<0.8	NC	3.6	4.2	15%	1.8	3.5	**64%**	4.2	5.2	21%
Chromium, Total (mg/L)	11%	0.024	0.013	**59%**	<0.0005	<0.0005	NC	<0.0005	0.0007	NC	<0.0005	<0.0005	NC	<0.0005	<0.0005	NC	<0.0005	<0.0005	NC
Cobalt (mg/L)	0%	4.1	4.4	7%	0.0001	0.00006	50%	<5e-005	0.0001	NC	<0.00063	<0.00012	NC	<0.00011	<0.00015	NC	<5e-005	<5e-005	NC
Copper (mg/L)	0%	574	550	4%	0.0057	0.0064	12%	0.0019	0.0023	19%	0.0057	0.0076	29%	0.0196	0.0261	28%	0.0097	0.008	19%
Iron (mg/L)	11%	3.3	1.5	**75%**	0.07	0.06	15%	0.1	0.12	18%	0.11	0.08	32%	<0.03	0.03	NC	0.06	<0.06	NC
Lead (mg/L)	0%	<0.001	<0.001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC
Lithium (mg/L)	0%	0.26	0.21	21%	<0.021	<0.022	NC	<0.008	0.01	NC	<0.008	0.015	NC	0.012	0.01	18%	<0.008	<0.008	NC
Magnesium (mg/L)	0%	309	284	8%	0.9	0.9	0%	<0.2	<0.2	NC	<0.7	<0.8	NC	0.2	0.6	100%	0.8	1	22%
Manganese (mg/L)	0%	12.4	11.8	5%	0.0025	0.003	18%	0.0008	0.0027	109%	0.0009	0.0008	12%	0.0004	0.0012	100%	0.0004	<0.0004	NC
Mercury (mg/L)	0%	<0.0002	<0.0002	NC	<0.0002	<0.0002	NC	<0.0002	<0.0002	NC	<0.0002	<0.0002	NC	<0.0002	<0.0002	NC	<0.0002	<0.0002	NC
Molybdenum (mg/L)	22%	<0.002	<0.002	NC	0.0413	0.0446	8%	0.0415	0.0833	**67%**	0.0136	0.0182	29%	0.0304	0.088	**97%**	0.01	0.0108	8%
Nickel (mg/L)	0%	1.21	1.17	3%	0.0005	0.0005	0%	<0.0004	0.0004	NC	<0.0004	0.0005	NC	<0.0004	0.0005	NC	<0.0004	0.0019	NC
Phosphorus (mg/L)	0%	<0.5	<0.5	NC	<0.1	<0.1	NC	<0.1	<0.1	NC	<0.1	<0.1	NC	<0.1	<0.1	NC	<0.1	<0.1	NC
Potassium (mg/L)	11%	4	6	40%	2.4	2.4	0%	0.5	0.7	33%	1.3	1.4	7%	0.9	1.2	29%	1.2	1.5	22%
Selenium (mg/L)	0%	0.046	0.044	4%	0.0001	0.0002	67%	0.0001	0.0002	67%	<0.0002	<0.0002	NC	0.0001	0.0003	100%	0.0003	0.0004	29%
Silver (mg/L)	0%	<0.001	<0.001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC
Sodium (mg/L)	11%	23	43	61%	57.9	59.9	3%	87.1	82.8	5%	51.3	53.3	4%	31.9	52.8	**49%**	6.3	7.3	15%
Strontium (mg/L)	11%	1.58	2.06	26%	0.055	0.058	5%	0.014	0.012	15%	0.032	0.036	12%	0.017	0.037	**74%**	0.046	0.059	25%
Thallium (mg/L)	0%	<0.001	<0.001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC
Thorium (mg/L)	0%	<0.01	<0.01	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC
Tin (mg/L)	0%	<0.2	<0.2	NC	<0.04	<0.04	NC	<0.04	<0.04	NC	<0.04	<0.04	NC	<0.04	<0.04	NC	<0.04	<0.04	NC
Titanium (mg/L)	11%	0.04	0.04	0%	<0.005	<0.005	NC	<0.005	<0.005	NC	0.005	<0.005	NC	<0.005	<0.005	NC	<0.005	<0.005	NC
Uranium (mg/L)	22%	2.27	1.66	31%	0.003	0.0034	13%	0.0101	0.0153	**41%**	0.002	0.0023	14%	0.002	0.006	100%	0.0002	0.0002	0%
Vanadium (mg/L)	11%	<0.005	<0.005	NC	0.184	0.16	14%	0.337	0.264	24%	0.27	0.29	7%	0.0308	0.0665	**73%**	0.0233	0.0283	19%
Zinc (mg/L)	0%	1.86	1.82	2%	<0.004	<0.004	NC	<0.004	<0.004	NC	<0.004	<0.004	NC	<0.004	<0.004	NC	<0.006	<0.006	NC
MWMP Radionuclides																			
Radium-226 (pCi/L)	11%	3.2 +/-0.48	7.7 +/-0.71	**7.56**	1.2 +/-0.52	0.54 +/-0.26	1.69	<-0.07 +/-0.35	0.86 +/-0.63	NC	<0.47 +/-0.47	1.2 +/-0.36	NC	<0.5 +/-0.29	0.92 +/-0.29	NC	0.94 +/-0.31	0.63 +/-0.32	0.98
Radium-228 (pCi/L)	0%	<1.5 +/-2.5	7.9 +/-2.8	NC	<1.4 +/-2.7	<-0.32 +/-2.4	NC	<3.8 +/-2.6	<0.52 +/-2.3	NC	<0.39 +/-2.5	<0.76 +/-2.5	NC	<1.8 +/-2.1	<1.5 +/-2.7	NC	<2 +/-2.6	<0.33 +/-2.7	NC
MWMP General Chemistry Parameters																			
Alkalinity as $CaCO_3$ (mg/L)	11%	<2	<2	NC	114	119	4%	174	160	8%	101	106	5%	55.4	95.3	**53%**	16.6	22	28%
Alkalinity, Bicarbonate as $CaCO_3$ (mg/L)	11%	<2	<2	NC	93.7	99	6%	103	129	22%	75.4	85.8	13%	52.2	78.8	**41%**	16.6	22	28%
Alkalinity, Carbonate as $CaCO_3$ (mg/L)	22%	<2	<2	NC	20	19.8	1%	70.8	31.6	77%	25.7	19.7	26%	3.2	16.5	**135%**	<2	<2	NC
Alkalinity, Hydroxide as $CaCO_3$ (mg/L)	0%	<2	<2	NC	<2	<2	NC	<2	<2	NC	<2	<2	NC	<2	<2	NC	<2	<2	NC
Chloride (mg/L)	11%	3	2.8	7%	4.7	4.7	0%	1.2	2.4	67%	0.8	0.9	12%	2.8	4.7	**51%**	1.2	1.5	22%
Fluoride (mg/L)	11%	<30	<20	NC	3.1	3.2	3%	5.5	6.5	17%	2.7	2.9	7%	1.8	3.2	**56%**	0.9	1	11%
Nitrogen, Kjeldahl (mg/L)	0%	1.7	1.6	6%	<0.1	<0.1	NC	0.2	0.3	40%	0.3	0.3	0%	0.3	0.3	0%	<0.2	<0.2	NC
Nitrogen, Nitrate (mg/L)	0%	1.54	1.77	14%	<0.02	0.02	NC	<0.02	0.05	NC	<0.02	<0.02	NC	<0.02	<0.02	NC	<0.02	0.02	NC
Nitrogen, Nitrate/Nitrite (mg/L)	0%	1.54	1.77	14%	<0.02	0.02	NC	<0.02	0.05	NC	<0.02	<0.02	NC	<0.02	<0.02	NC	<0.02	0.02	NC
Nitrogen, Nitrite (mg/L)	0%	<0.01	<0.01	NC	<0.01	<0.01	NC	<0.01	<0.01	NC	<0.01	<0.01	NC	<0.01	<0.01	NC	<0.01	<0.01	NC
pH (s.u.)	0%	3.6	3.7	3%	8.7	8.7	0%	9.2	8.9	3%	8.9	8.8 H	NC	8.5	8.9	5%	7.4	7.8	5%
Sulfate (mg/L)	0%	3990	3370	17%	16.4	16.8	2%	<1	11.6	NC	6.9	6.4	8%	10.7	15.7	38%	7.3	8.6	16%
Total Dissolved Solids (mg/L)	11%	6320	5600	12%	202	204	1%	270	252	7%	184	192	4%	116	186	**46%**	60	66	10%
WAD Cyanide (mg/L)	0%	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC

Appendix 5D-1, Table 5D1-2b
Summary of MWMP Field Duplicate Results - OU-5 2019 - 2020
Combined OU-4b, OU-5, and OU-6 Remedial Investigation
Anaconda Copper Mine Site
Lyon County, Nevada

Location ID	WRSB-228	WRSB-228		WRSB-232	WRSB-232		WRSB-238	WRSB-238	
Sample Depth (ft bgs)	0.5-3	0.5-3		6-15	6-15		6-15	6-15	
Sample Date	1/23/2020	1/23/2020		1/17/2020	1/17/2020		1/27/2020	1/27/2020	
Sample Type	N	FD	RPD[1]	N	FD	RPD[1]	N	FD	RPD[1]
MWMP Metals	***DQI Outlier***								
Aluminum (mg/L)	11%	<0.05	0.18	**110%**	0.07	<0.05	NC	0.11	<0.05	NC
Antimony (mg/L)	0%	<0.0004	<0.0004	NC	0.0004	0.0004	0%	0.0007	0.001	35%
Arsenic (mg/L)	11%	0.0192	0.0129	39%	0.0428	0.0458	7%	0.116	0.129	11%
Barium (mg/L)	22%	<0.007	0.007	NC	<0.007	0.032	**130%**	0.013	0.041	**104%**
Beryllium (mg/L)	0%	<8e-005	<8e-005	NC	<8e-005	<8e-005	NC	<8e-005	<8e-005	NC
Boron (mg/L)	11%	<0.16	<0.15	NC	0.55	0.52	6%	1.19	1.42	18%
Cadmium (mg/L)	0%	<5e-005	<5e-005	NC	<5e-005	<5e-005	NC	<5e-005	<5e-005	NC
Calcium (mg/L)	11%	1.7	1.2	34%	1.1	1	10%	30.6	24.9	21%
Chromium, Total (mg/L)	11%	<0.0005	<0.0005	NC	<0.0005	<0.0005	NC	<0.0005	0.0005	NC
Cobalt (mg/L)	0%	0.00005	0.00006	18%	<5e-005	<5e-005	NC	0.00024	0.00019	23%
Copper (mg/L)	0%	0.0037	0.0044	17%	0.0013	0.0009	36%	<0.0079	<0.0053	NC
Iron (mg/L)	11%	<0.06	0.13	NC	0.05	<0.03	NC	0.09	<0.06	NC
Lead (mg/L)	0%	<0.0001	0.0003	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC
Lithium (mg/L)	0%	<0.008	<0.008	NC	0.008	<0.008	NC	<0.008	0.008	NC
Magnesium (mg/L)	0%	0.2	<0.2	NC	<0.2	0.3	NC	4.2	3	33%
Manganese (mg/L)	0%	<0.0004	<0.0004	NC	0.0008	0.0005	46%	0.0006	0.0005	18%
Mercury (mg/L)	0%	<0.0002	<0.0002	NC	<0.0002	<0.0002	NC	<0.0002	<0.0002	NC
Molybdenum (mg/L)	22%	0.0303	0.0246	21%	0.0357	0.0294	19%	0.127	0.187	38%
Nickel (mg/L)	0%	<0.0004	<0.0004	NC	0.0069	<0.0004	NC	<0.0004	<0.0004	NC
Phosphorus (mg/L)	0%	<0.1	<0.1	NC	<0.1	0.1	NC	<0.1	0.1	NC
Potassium (mg/L)	11%	0.9	0.6	40%	0.8	0.7	13%	1	2.5	**86%**
Selenium (mg/L)	0%	0.0002	0.0002	0%	<0.0001	<0.0001	NC	0.0012	0.0016	29%
Silver (mg/L)	0%	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC
Sodium (mg/L)	11%	8.1	7.2	12%	64.4	62.8	3%	137	170	21%
Strontium (mg/L)	11%	0.017	0.014	19%	0.014	0.021	40%	0.361	0.33	9%
Thallium (mg/L)	0%	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC
Thorium (mg/L)	0%	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC
Tin (mg/L)	0%	<0.04	<0.04	NC	<0.04	<0.04	NC	<0.04	<0.04	NC
Titanium (mg/L)	11%	<0.005	0.006	NC	<0.005	0.051	**180%**	0.006	<0.005	NC
Uranium (mg/L)	22%	0.0002	0.0002	0%	0.0049	0.0056	13%	0.0119	0.0211	**56%**
Vanadium (mg/L)	11%	0.0129	0.0091	35%	0.148	0.145	2%	0.278	0.221	23%
Zinc (mg/L)	0%	<0.006	<0.006	NC	<0.004	<0.004	NC	<0.006	<0.006	NC
MWMP Radionuclides										
Radium-226 (pCi/L)	11%	7.3 +/-0.74	<0.21 +/-0.4	NC	0.69 +/-0.28	<0.48 +/-0.27	NC	0.5 +/-0.34	<0.58 +/-0.55	NC
Radium-228 (pCi/L)	0%	<1.5 +/-2.7	<-0.71 +/-2.7	NC	<1.9 +/-2.6	<-0.38 +/-2.5	NC	<1.4 +/-2.7	<1.8 +/-2.7	NC
MWMP General Chemistry Parameters										
Alkalinity as $CaCO_3$ (mg/L)	11%	14.6	11.4	25%	135	153	13%	107	125	16%
Alkalinity, Bicarbonate as $CaCO_3$ (mg/L)	11%	14.6	11.4	25%	89.3	65.7	30%	85.7	104	19%
Alkalinity, Carbonate as $CaCO_3$ (mg/L)	22%	<2	<2	NC	45.2	87.3	**64%**	21.5	20.4	5%
Alkalinity, Hydroxide as $CaCO_3$ (mg/L)	0%	<2	<2	NC	<2	<2	NC	<2	<2	NC
Chloride (mg/L)	11%	0.6	<0.5	NC	0.8	0.8	0%	1.6	3.3	69%
Fluoride (mg/L)	11%	1.3	1	26%	2	2	0%	4.7	5.1	8%
Nitrogen, Kjeldahl (mg/L)	0%	<0.2	<0.2	NC	0.3	0.6	67%	<0.2	0.2	NC
Nitrogen, Nitrate (mg/L)	0%	<0.02	<0.02	NC	<0.02	<0.02	NC	0.17	0.16	6%
Nitrogen, Nitrate/Nitrite (mg/L)	0%	<0.02	<0.02	NC	<0.02	<0.02	NC	0.17	0.16	6%
Nitrogen, Nitrite (mg/L)	0%	<0.01	<0.01	NC	<0.01	<0.01	NC	<0.01	<0.01	NC
pH (s.u.)	0%	7.2	7.3	1%	9	9.2	2%	8.7	8.7	0%
Sulfate (mg/L)	0%	4.3	3.8	12%	3.8	3.4	11%	226	267	17%
Total Dissolved Solids (mg/L)	11%	48	38	23%	196	184	6%	568	646	13%
WAD Cyanide (mg/L)	0%	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC

Note(s)
1. RPD or RER calculated using equations presented in the QAPP when at least one reported result in the duplicate pair is greater than the detection limit.
2. Calculated values not meeting precision criteria in the QAPP for applicable parameters are shown in bold font.

Abbreviation(s)
% = percent
< = less than
$CaCO_3$ = calcium carbonate
DQI = data quality indicator
FD = field duplicate sample
ft bgs = feet below ground surface
ID = identification
mg/L = milligram per liter
MWMP = meteoric water mobility procedure
N = normal (primary) sample
NC = not calculated
OU = operable unit
pCi/L = picocurie per liter
QAPP = quality assurance project plan
RER = replicate error ratio
RPD = relative percent difference
s.u. = standard units
WAD = weak acid dissociable

Appendix 5D-1, Table 5D1-3
Summary of Field Blank Results - OU-5 2019 - 2020
Combined OU-4b, OU-5, and OU-6 Remedial Investigation
Anaconda Copper Mine Site
Lyon County, Nevada

	Location ID	WRSB-210	WRSB-208	WRSB-214	WRSB-230	WRSB-219	WRSB-206	WRSB-206	WRSB-207	WRSB-223	WRSB-237	WRSB-229	WRSB-208	WRSB-221	WRSB-222	WRSB-212	WRSB-215	WRSB-240	WRSB-206	WRSB-207	WRSB-234
	Sample ID	EB08	EB10	EB12	EB13	EB-14	EB15	EB16	EB17	EB18	EB19	FB07	FB10	FB12	FB14	FB15	FB13	FB16	FB17	FB18	FB19
	Sample Date	12/18/2019	1/7/2020	1/10/2020	1/16/2020	1/21/2020	1/21/2020	1/21/2020	1/22/2020	1/23/2020	1/24/2020	12/18/2019	1/8/2020	1/10/2020	1/15/2020	1/15/2020	1/14/2020	1/21/2020	1/21/2020	1/22/2020	1/23/2020
	Sample Type	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	FB	FB	FB	FB	FB	FB	FB	FB	FB	FB
Total Metals	***Frequency of Detection***																				
Aluminum (mg/L)	10%	**0.12**	0.060 J	< 0.050	< 0.050	--	< 0.050	< 0.050	< 0.050	0.12 J	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Antimony (mg/L)	0%	< 0.50	< 0.50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 0.50	< 0.50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Arsenic (mg/L)	0%	< 0.50	< 0.50	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 0.50	< 0.50	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Barium (mg/L)	10%	**1.0**	**1.3**	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	0.68 J	< 0.50	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Beryllium (mg/L)	0%	< 0.25	< 0.25	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.25	< 0.25	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Boron (mg/L)	0%	< 25	< 25	< 25	< 25	--	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
Cadmium (mg/L)	0%	< 0.25	< 0.25	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.25	< 0.25	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Calcium (mg/L)	20%	**0.19**	**0.19**	**0.14**	**0.10**	--	0.078 J	0.063 J	< 0.30	< 0.30	< 0.30	0.099 J	< 0.050	0.081 J	0.050 J	0.064 J	0.076 J	0.052 J	0.052 J	< 0.30	< 0.30
Chromium (mg/L)	5%	< 0.50	1.8 J	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	**11**	0.61 J	< 0.50	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Cobalt (mg/L)	0%	< 0.50	< 0.50	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.50	< 0.50	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Copper (mg/L)	30%	**5.9**	**2.0**	< 1.9	2.5 J	**4.7**	2.9 J	< 1.9	< 1.9	**13**	**3.2**	1.8 J	< 0.50	< 1.9	< 1.9	2.8 J	**3.2**	< 1.9	< 1.9	< 1.9	< 1.9
Iron (mg/L)	10%	**0.11**	0.080 J	< 0.050	< 0.050	--	< 0.050	< 0.050	< 0.030	**0.10**	< 0.030	0.057 J	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.030	< 0.030
Lead (mg/L)	0%	< 0.50	< 0.50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.3 J	< 1.0	< 1.0	< 0.50	< 0.50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7 J	< 1.0
Lithium (mg/L)	0%	< 25	< 25	< 25	< 25	--	< 25	< 25	< 15	< 15	< 15	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 15	< 15
Magnesium (mg/L)	10%	**0.055**	**0.032**	0.017 J	0.019 J	--	0.011 J	< 0.010	< 0.30	< 0.30	< 0.30	0.028	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.30	< 0.30
Manganese (mg/L)	5%	1.5 J	**8.8**	1.5 J	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	1.5 J	1.5 J	< 1.5	< 0.50	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Mercury (mg/L)	0%	< 0.00010	< 0.00010	< 0.00010	< 0.00010	--	< 0.00010	< 0.00010	< 0.060	< 0.060	< 0.060	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.060	< 0.060
Molybdenum (mg/L)	0%	< 0.50	< 0.50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 0.50	< 0.50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Nickel (mg/L)	0%	< 0.50	0.59 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 0.50	< 0.50	< 2.0	< 2.0	2.7 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Phosphorus (mg/L)	0%	< 0.10	< 0.10	< 0.10	< 0.10	--	< 0.10	< 0.10	< 0.075	< 0.075	< 0.075	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.075	< 0.075
Potassium (mg/L)	0%	< 0.25	< 0.25	< 0.25	< 0.25	--	< 0.25	< 0.25	< 1.5	< 1.5	< 1.5	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 1.5	< 1.5
Selenium (mg/L)	0%	< 0.50	< 0.50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 0.50	< 0.50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Silver (mg/L)	0%	< 0.50	< 0.50	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.50	< 0.50	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Sodium (mg/L)	0%	< 0.26	< 0.26	< 0.26	0.29 J	--	0.26 J	< 0.26	< 0.30	< 0.30	< 0.30	< 0.26	< 0.26	< 0.26	0.31 J	0.30 J	< 0.26	< 0.26	< 0.26	< 0.30	< 0.30
Strontium (mg/L)	0%	< 0.010	< 0.010	< 0.010	< 0.010	--	< 0.010	< 0.010	< 0.0015	< 0.0015	< 0.0015	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0015	< 0.0015
Thallium (mg/L)	0%	< 0.20	< 0.20	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.20	< 0.20	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Thorium (mg/L)	0%	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Tin (mg/L)	0%	< 0.050	< 0.050	< 0.050	< 0.050	--	< 0.050	< 0.050	< 0.030	< 0.030	< 0.030	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.030	< 0.030
Titanium (mg/L)	10%	**0.0065**	< 0.0025	< 0.0025	< 0.0025	--	< 0.0025	< 0.0025	< 0.0050	< 0.0050	< 0.0050	**0.0075**	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0050	< 0.0050
Uranium (mg/L)	0%	< 0.50	< 0.50	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.50	< 0.50	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Vanadium (mg/L)	0%	< 1.0	< 1.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 1.0	< 1.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (mg/L)	0%	2.5 J	2.8 J	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 2.5	12 J	< 7.5	13 J	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5

Note(s)
1. Detections above the reporting limit are shown in bold font.

Abbreviation(s)
% = percent
< = less than
-- = not analyzed
EB = equipment blank
FB = field blank
ID = identification
J = estimated detection
mg/L = milligram per liter

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wood.

Appendix 5D-2

2019 – 2020 OU-5 Analytical Laboratory Reports

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wood.

Appendix 5D-3

2019 – 2020 OU5 Data Validation Reports

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wood.

Appendix 5D-4

2018 – 2020 OU-5 Database Export and User Guide

Appendix 5D-4: Analytical Database Export User Guide

This Analytical Database Export Users Guide has been developed to aid users of the attached export from the Environmental Data Management System (EDMS) representing the final analytical data associated with the Anaconda Copper Mine Site (Site), Lyon County, Nevada.

Database Overview

The EDMS is a relational database that can manage the large quantity and wide variety of environmental data generated at the Site. The structure of the relational database has been normalized so that each piece of information is stored only once and that data duplication and divergence are avoided. Referential integrity is strictly enforced through indexes, key fields, and relationships. Lookup tables and valid values provide consistent nomenclature of sample locations, well identifications, chemical names, units, etc. The relational database architecture provides excellent data quality and integrity, quick access and manipulation for large data files, and optimal storage space on the data server.

Site data is managed by the Environmental Quality Information System (EQuIS). EQuIS is a software system produced by EarthSoft, Inc., and is used to store field data and associated laboratory results from sampling locations. EQuIS is widely used throughout the environmental industry and has many modules for integration into other specialist programs used for Site data such as ArcGIS.

Database Export Overview

Exports of analytical data in the EDMS are prepared following verification and validation of data generated from the related investigation or program. Beginning July 2019, data has been exported to Microsoft Excel only and no longer provided in Microsoft Access format, unless directed. This change seeks to make data more functional to users of the reported results. The Microsoft Excel export represents an updated snapshot of the primary data fields contained in the EDMS for a given date range. The export is provided as a comprehensive table of data contained in select fields from EQuIS. This document describes the data fields included in the Microsoft Excel deliverable to support user understanding of database related nomenclature. In addition, working data tables have been created from queries into a cross tabulated format which may aid to support statistics or other software tools employed by users.

Database Export Table – Field Definitions

The following are explanations of the 16 fields contained in the Microsoft Excel deliverable 'DB Export' tab and will be provided in "Column ID: Field Name" format.

1. Sort Location – includes a leading 0 in certain well IDs to allow an numerically ordered sort
2. Location Name – assigned well ID
3. Sample Type – describes whether sample is a primary sample (N) or field quality control sample (FD)
    a. N = normal environmental sample (primary sample)
    b. FD = field duplicate sample
4. Sample Date – sample collection date
5. Zone ID – depth zone description of sample (if applicable)
6. Easting – x-coordinate of sample location
7. Northing – y-coordinate of sample location
8. Analytical Method – laboratory test method

9. Fraction – describes if test results represent exclusively the dissolved (e.g., water soluble) parameter from field filtered samples or not, most often used for metals and radionuclides.
    a. D = dissolved parameter (field filtered)
    b. T = total parameter (not field filtered)
    c. N =not applicable parameter (to test method).
10. Parameter – name of analyte tested
11. Report Result – text formatted result to include symbols and qualifiers as part of the final result as shown in tables
12. Result Value – numeric formatted result excluding any related symbols or qualifiers
    a. Detections reflect the measured concentration in the sample
    b. Non-detects reflect the method detection limit for the sample
13. Final Qualifier – alpha character resulting from data verification and validation following the rules described in the Site-wide QAPP
    a. J = estimated value
    b. U = non-detect value
    c. UJ = estimated non-detect value
    d. R = rejected value
    e. UR = rejected non-detect value
14. Reason Code – alpha character supporting the Final Qualifier defining the cause for qualifying the reported values to indicate bias following the rules described in the Site-wide QAPP
15. RDL – reporting detection limit (e.g., practical quantitation limit)
16. MDL – method detection limit (e.g., minimum quantitation limit)

Working Table - Field Descriptions

Three crosstab (X-Tab) data tables (worksheets) are included to format data in a location-row, parameter-column layout for easier data manipulation. These worksheets organize results by fraction (as defined in the Fraction field of the comprehensive export).

1. D Fraction X-Tab = dissolved parameter results (field filtered)
2. T Fraction X-Tab = total parameter results (not field filtered)
3. N Fraction X-Tab =not applicable parameter results (to test method).

An additional binary column field (D_parameter name) is paired with the parameter value (numeric format) column where a '0' denotes a non-detect value and a '1' denotes a detected value. The working tables represent a subset of the more comprehensive fields in the database export file and exclude any rejected data results which are deemed invalid and not useable.